Amendments to the Claims

1. (original) A method of inducing a surface refractive index modification in ferroelectric material, comprising:

providing a sample of ferroelectric material;

determining a desired pattern of surface refractive index modification to be induced in the sample; and

exposing an area of the sample corresponding to the desired pattern to optical radiation to deliver a quantity of optical energy sufficient to induce a permanent surface refractive index modification in the exposed area of the sample.

2. (original) A method according to claim 1, in which the quantity of optical energy is selected to induce a surface refractive index modification of a desired magnitude.

3. (original) A method according to claim 2, in which the quantity of optical energy is determined by controlling one or more of intensity of the optical radiation, fluence of the optical radiation, duration of exposing the area of the sample, and absorption depth of the optical radiation in the sample.

4. (currently amended) A method according to claim 1 ~~any preceding claim~~, in which the optical radiation has a sub-micron absorption depth in the sample.

5. (currently amended) A method according to claim 1 ~~any one of claims 1 to 4~~, in which the optical radiation is of an ultraviolet wavelength.

6. (currently amended) A method according to claim 1 ~~any one of claims 1 to 4~~, in which the optical radiation is of a visible wavelength.

7. (currently amended) A method according to claim 1 ~~any one of claims 1 to 6~~, in which the exposing an area of the sample comprises directing a focussed beam of optical radiation onto the sample.

8. (original) A method according to claim 7, in which the exposing an area of the sample further comprises causing relative movement between the sample and the beam of optical radiation.

9. (original) A method according to claim 8, in which the relative movement is of a constant speed.

10. (original) A method according to claim 8, in which the relative movement is of a varying speed.

11. (currently amended) A method according to claim 7 ~~any one of claims 7 to 10~~, in which the beam of optical radiation contains fringes of high and low intensity to induce a refractive index modification having the form of an optical grating.

12. (currently amended) A method according to claim 1 ~~any one of claims 1 to 6~~, in which the exposing an area of the sample comprises projecting the optical radiation through a mask and onto the sample.

13. (original) A method according to claim 12, in which the mask includes one or more regions configured to project fringes of high and low intensity optical radiation onto the sample to induce a refractive index modification having the form of an optical grating.

14. (currently amended) A method according to claim 1 ~~any one of claims 1 to 13~~, in which the desired pattern of surface refractive index modification comprises a line so that the induced permanent refractive index modification comprises a channel waveguide.

15. (currently amended) A method according to claim 1 ~~any one of claims 1 to 13~~, in which the desired pattern of surface refractive index modification comprises a network of lines so that the induced permanent refractive index modification comprises a network of channel waveguides.

16. (currently amended) A method according to claim 1 ~~any one of claims 1 to 13~~, in which the desired pattern of surface refractive index modification comprises a continuous region so that the induced permanent refractive index modification comprises a planar waveguide.

17. (currently amended) A method according to claim 1 ~~any preceding claim~~, in which the sample of ferroelectric material comprises one or more dopants.

18. (original) A method according to claim 17, in which the one or more dopants comprise optically active ions that allow a waveguide formed in the sample to exhibit laser or amplifying action.

19. (currently amended) A method according to claim 17 ~~or claim 18~~, in which the one or more dopants increase absorption of the optical radiation by the sample.

20. (currently amended) A method according to claim 17 ~~any one of claims 17 to 19~~, in which the one or more dopants reduces susceptibility of the sample to photorefractive damage caused by exposure to the optical radiation.

21. (currently amended) A method according to claim 1 ~~any preceding claim~~, in which the sample of ferroelectric material has a domain-engineered structure.

22. (original) A method according to claim 21, in which the sample is periodically poled.

23. (currently amended) A method according to claim 1 ~~any preceding claim~~, in which the sample comprises a pre-existing structure of altered refractive index, and the desired pattern of surface refractive index modification is determined to modify the pre-existing structure.